CLAIMS

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1-32. (canceled)

33. (currently amended) Signal processing apparatus comprising:

a signal amplifier and a frequency converter which operate in succession on an input signal,

a pilot signal generator adapted to introduce a pilot signal into the input signal prior to frequency conversion and amplification, and

a lineariser which is provided between the amplifier and the frequency converter to introduce a correction signal that is adapted to make the overall input and output characteristic of the apparatus more linear by linearising both the amplifier and frequency converter, wherein:

a feedback signal, derived from the output of the apparatus and containing distortion components from the pilot signal produced by at least one of the frequency converter and the amplifier, is used by the lineariser to adapt the correction signal, [[and]]

the pilot signal is removed from the output of the apparatus by a filter or by the introduction of a pilot cancellation signal,

the lineariser comprises a distortion generator for producing the correction signal from the output signal of whichever of the amplifier and the frequency converter precedes it, and

the distortion generator comprises a non-linearity generator arranged to generate a third-order non-linearity by mixing the input to the non-linearity generator with itself and then with its input

34-35. (canceled)

36. (previously presented) A signal processing apparatus according to Claim 33, wherein the pilot signal is one of a CW carrier signal, a full carrier AM signal, a suppressed carrier AM signal, a single sideband signal, a quadrature amplitude modulated signal, a filtered quadrature phase shift keyed signal, a direct sequence spread spectrum signal, and a frequency hopped carrier signal modulated with any of the foregoing kinds of signal.

37. (previously presented) Signal processing apparatus according to Claim 33, wherein the pilot signal is one of a two-tone pilot signal and a multi-tone pilot signal.

38. (canceled)

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39. (previously presented) Signal processing apparatus according to Claim 33, wherein the pilot cancellation signal is adjusted using feedback derived from the output of the apparatus.

40. (previously presented) Signal processing apparatus according to Claim 33, wherein the pilot cancellation signal comprises a frequency converted, phase shifted and amplitude adjusted version of the pilot signal.

41. (previously presented) Signal processing apparatus according to Claim 33, wherein a digital signal processor is used to control the pilot cancellation signal using feedback from the output of the signal processing apparatus.

42. (previously presented) Signal processing apparatus according to Claim 33, further comprising a suppressor for cancelling signals which are images of the pilot signal.

43. (previously presented) Signal processing apparatus according to Claim 33, wherein a digital signal processor is used to control the correction signal using feedback from the output of the signal processing apparatus.

44-45. (canceled)

46. (currently amended) Signal processing apparatus according to Claim [[45]] 33, wherein the non linearity generator uses at least one of anti-parallel diodes, a FET channel, dual gate GaAsFETs operating close to pinch-off, Shottky diodes, mixers and multipliers in the non-linearity generating process.

47-48. (canceled)

49. (currently amended) Signal processing apparatus according to Claim [[47]] 33, wherein components of the non-linearity are generated and controlled separately.

50. (previously presented) Signal processing apparatus according to Claim 49, wherein in-phase and quadrature signals are produced from each separately generated non-linearity component and are controlled separately.

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51. (previously presented) Signal processing apparatus according to Claim 33, wherein the frequency converter comprises a mixer for mixing a mixing signal into a received signal destined to be frequency converted.

52. (previously presented) Signal processing apparatus according to Claim 33, wherein the frequency converter is an upconverter for converting an intermediate frequency band signal into a radio frequency band signal.

53. (previously presented) Signal processing apparatus according to Claim 52, wherein the frequency converter comprises in-phase and quadrature signal paths for handling in-phase and quadrature signals representing a signal at the intermediate frequency band, wherein there is a separate, independently controlled, lineariser operating on each of these signal paths.

54. (previously presented) Signal processing apparatus according to Claim 33, wherein the frequency converter is a downconverter for converting a radio frequency band signal into an intermediate frequency band signal.

55. (previously presented) Signal processing apparatus according to Claim 54, wherein the frequency converter comprises in-phase and quadrature signal paths for handling in-phase and quadrature signals representing a signal at the intermediate frequency band, wherein there is a separate, independently controlled, lineariser operating on each of these signal paths.

56. (previously presented) Signal processing apparatus according to Claim 33, wherein the input signal is a CDMA signal.

57. (currently amended) A method of processing an input signal to produce an output signal, the method comprising the steps of:

signal amplification and frequency conversion,

introducing a pilot signal into the input signal prior to frequency conversion and amplification,

introducing, between the steps of amplification and frequency conversion, a correction signal that is adapted to make the overall input and output characteristic of the signal processing method more linear by linearising both the amplification and frequency conversion,

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using a feedback signal, derived from the output signal of the signal processing method and containing distortion components from the pilot signal produced by at least one of the frequency conversion and amplification steps, to adapt the correction signal, and

removing the pilot signal from the output signal of the method by filtering or by introducing a pilot cancellation signal, wherein:

the correction signal is produced by a step of distorting the signal produced by whichever of the amplifying and frequency conversion steps precedes it, and

distorting the signal comprises generating a third-order non-linearity by mixing the input signal with itself and then with the input signal.

58-60. (canceled)

61. (previously presented) A method according to Claim 57, comprising the step of adjusting the pilot cancellation signal using feedback derived from the output signal of the signal processing method.

62. (canceled)

63. (currently amended) A method according to Claim [[62]] 57, wherein the step of distortion generation comprises the step of generating and controlling non-linearity components independently.

64. (previously presented) A method according to Claim 57, wherein the input signal is a CDMA signal.

65. (currently amended) Signal processing apparatus comprising a signal amplifier and a frequency converter which operate in succession on an input signal, and a lineariser which is provided between the amplifier and the frequency converter to introduce a correction signal that is adapted to make the overall input and output characteristic of the apparatus more linear by linearising both the amplifier and frequency converter, wherein:

the lineariser comprises a distortion generator for producing the correction signal from the output signal of whichever of the amplifier and the frequency converter precedes it, and

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the distortion generator comprises a non-linearity generator arranged to generate ~~the~~ a third-order non-linearity by mixing ~~its input signal with itself one or more times to produce the non-linearity~~ the input to the non-linearity generator with itself and then with its input.

66. (previously presented) Signal processing apparatus according to Claim 65, wherein the non linearity generator uses at least one of anti-parallel diodes, a FET channel, dual gate GaAsFETs operating close to pinch-off, Shottky diodes, mixers and multipliers in the non-linearity generating process.

67. (canceled)

68. (previously presented) Signal processing apparatus according to Claim 65, wherein components of the non-linearity are generated and controlled separately.

69. (previously presented) Signal processing apparatus according to Claim 68, wherein in-phase and quadrature signals are produced from each separately generated non-linearity component and are controlled separately.

70. (currently amended) A method of processing an input signal to produce an output signal, the method comprising the steps of signal amplification and frequency conversion, and the step of introducing~~, between the steps of amplification and frequency conversion,~~ a correction signal that is adapted to make the overall input and output characteristic of the signal processing method more linear by linearising both the amplification and frequency conversion, wherein:

the correction signal is introduced between the step of signal amplification and the step of frequency conversion;

the correction signal is produced by a step of distorting the signal produced by whichever of the amplifying and frequency conversion steps precedes it, ~~and~~

the step of distortion generation comprises the step of generating and controlling non-linearity components independently, and

the step of distortion generation comprises generating a third-order non-linearity by mixing the input signal with itself and then with the input signal.

71. (previously presented) Signal processing apparatus according to Claim 33, wherein the pilot signal is removed from the output of the apparatus by the filter.

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72. (previously presented) Signal processing apparatus according to Claim 33, wherein the pilot signal is removed from the output of the apparatus by the introduction of the pilot cancellation signal.

73. (previously presented) A method according to Claim 57, further comprising the step of removing the pilot signal from the output signal of the method by filtering.

74. (previously presented) A method according to Claim 57, further comprising the step of removing the pilot signal from the output signal of the method by introducing the pilot cancellation signal.

75. (new) Signal processing apparatus comprising:

a signal amplifier and a frequency converter which operate in succession on an input signal,

a pilot signal generator adapted to introduce a pilot signal into the input signal prior to frequency conversion and amplification, and

a lineariser which is provided between the amplifier and the frequency converter to introduce a correction signal that is adapted to make the overall input and output characteristic of the apparatus more linear by linearising both the amplifier and frequency converter, wherein:

a feedback signal, derived from the output of the apparatus and containing distortion components from the pilot signal produced by at least one of the frequency converter and the amplifier, is used by the lineariser to adapt the correction signal,

the pilot signal is removed from the output of the apparatus by a filter or by the introduction of a pilot cancellation signal,

the lineariser comprises a distortion generator for producing the correction signal from the output signal of whichever of the amplifier and the frequency converter precedes it,

the distortion generator comprises a non-linearity generator arranged to generate the non-linearity by mixing its input signal with itself one or more times to produce the non-linearity,

components of the non-linearity are generated and controlled separately, and

in-phase and quadrature signals are produced from each separately generated non-linearity component and are controlled separately.